Pre-Calculus
REVIEW 12.1 – 12.2

Name: _____

For numbers 1 – 2, construct a table to find the indicated limit.

1. $\lim_{x\to 2}\left(x^2-1\right)$

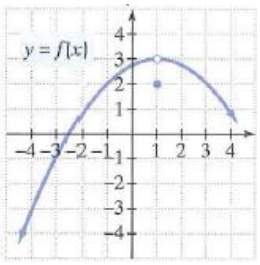
| $x$ | $y$ |
|---|---|
| 1.99 | |
| 1.999 | |
| 1.9999 | |
| 2.0001 | |
| 2.001 | |
| 2.01 | |

2. $\lim_{x\to -5}\dfrac{x^2-25}{x+5}$

| $x$ | $y$ |
|---|---|
| –5.0001 | |
| –5.001 | |
| –5.01 | |
| –4.9999 | |
| –4.999 | |
| –4.99 | |

For numbers 3 – 7, use the graph of $f$ to find the indicated limits.

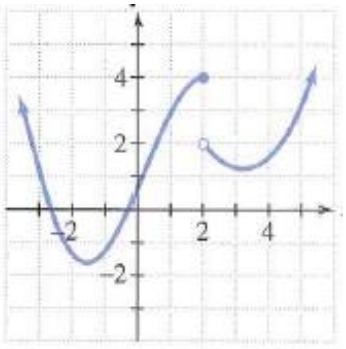
3. a) $\lim_{x\to 1} f(x)$



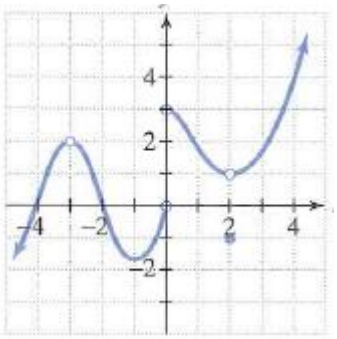

4. a) $\lim_{x\to 2^-} f(x)$

b) $\lim_{x\to 2^+} f(x)$

c) $\lim_{x\to 2} f(x)$



5.

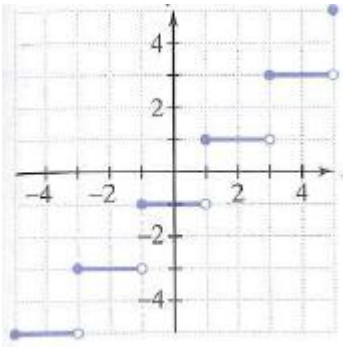


a) $\lim_{x\to -3^-} f(x)$ b) $\lim_{x\to -3^+} f(x)$ c) $\lim_{x\to -3} f(x)$

d) $\lim_{x\to 0^-} f(x)$ e) $\lim_{x\to 0^+} f(x)$ f) $\lim_{x\to 0} f(x)$

g) $\lim_{x\to 2^-} f(x)$ h) $\lim_{x\to 2^+} f(x)$ i) $\lim_{x\to 2} f(x)$ j) $f(2)$

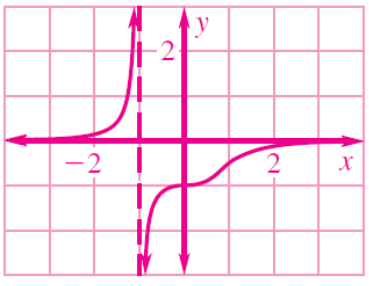
6.



a) $\lim_{x\to 3^-} f(x)$ b) $\lim_{x\to 3^+} f(x)$ c) $\lim_{x\to 3} f(x)$ d) $f(3)$

e) $\lim_{x\to 3.5^-} f(x)$ f) $\lim_{x\to 3.5^+} f(x)$ g) $\lim_{x\to 3.5} f(x)$ h) $f(3.5)$

7.




a) $\lim_{x\to -1^-} f(x)$ b) $\lim_{x\to -1^+} f(x)$ c) $\lim_{x\to -1} f(x)$

d) $\lim_{x\to -\infty} f(x)$ e) $\lim_{x\to \infty} f(x)$

For numbers 8 –23, use properties of limits to find the indicated limit. It may be necessary to rewrite an expression before limit properties can be applied.

8. $\lim_{x\to 3}(-6)$

9. $\lim_{x\to 3} x$

10. $\lim_{x\to -3} 5x^2$

11. $\lim_{x\to 4}(6x-21)^3$

12. $\lim_{x\to -1}\sqrt{5x^2+4}$

13. $\lim_{x\to 3}\dfrac{x^2-4}{x-2}$

14. $\lim_{x\to 2}\dfrac{x^2-4}{x-2}$

15. $\lim_{x\to 3}\dfrac{4x-12}{x-3}$

16. $\lim_{x\to 3}\dfrac{x^2-x-6}{x^2-9}$

17. $\lim_{x\to -1}\dfrac{x^3+2x^2+x}{x^4+x^3+2x+2}$

18. $\lim_{x\to 7}\dfrac{4x^2+2x-4}{x-7}$

19. $\lim_{x\to 100}\dfrac{\sqrt{x}-10}{x-100}$

20. $\lim_{x\to 4}\dfrac{4x^2-64}{2\sqrt{x}-4}$

21. $\lim_{x\to \infty}\dfrac{3x^9}{4x^{10}+1}$

22. $\lim_{x\to \infty}\dfrac{6x^{14}+5x}{8x^{14}}$

23. $\lim_{x\to -\infty}\left(-4x^2+3x+6\right)$

For numbers 24 – 25, a piecewise function is given. Determine the indicated limit, or state that the limit does not exist.

24. $f(x)=\begin{cases} x+6 \text{ if } x<1 \\ x+9 \text{ if } x\geq 1 \end{cases}$

a) $\lim_{x\to 1^-} f(x)$

b) $\lim_{x\to 1^+} f(x)$

c) $\lim_{x\to 1} f(x)$

25. $f(x)=\begin{cases} x^2+6 \text{ if } x<2 \\ x^3+2 \text{ if } x\geq 2 \end{cases}$

a) $\lim_{x\to 2^-} f(x)$

b) $\lim_{x\to 2^+} f(x)$

c) $\lim_{x\to 2} f(x)$